

Appeal submitted by licensee

Maine DEP, NMRO

AUG 03 2009



July 28, 2009

HAND DELIVERED

Susan Lessard, Chair
c/o Terry Hanson
Board of Environmental Protection
State House Station 17
Augusta, Maine 04333

RE: Administrative Appeal of Boralex Ashland, LP Minor Revision
License # S-021177-SE-G-M

Dear Chair Lessard:

Please find attached the request for an Administrative Appeal of a recent Solid Waste Order - Boralex Ashland, LP's Minor Revision (# S-021177-SE-G-M) filed with the Board on June 29, 2009.

If you have any questions, please feel free to contact me directly or contact my contractor, John Leslie of New England Organics at 207-461-1000.

Sincerely,

A handwritten signature in black ink, appearing to read "Tim Mitchell", with a long horizontal flourish extending to the right.

Tim Mitchell
Boralex Ashland, LP

**Administrative Appeal of Solid Waste Order, Minor Revision for
Woodash Utilization Program License # S-021177-SE-G-M
Boralex Ashland, LP**

July 28, 2009

On September 9, 2006, Boralex Ashland filed a request for a Minor Revision to its Woodash Utilization Program License to modify the following:

- Removing the potassium limitation when calculating wood ash application rates and reverting to the more restrictive of either the liming needs or the crop uptake of phosphorus.
- Eliminating the requirement for soil sampling when wood ash is sold to a farmer.

On June 29, 2009, the Department of Environmental Protection issued Solid Waste Order, Minor Revision #S-021177-SE-G-M for Boralex Ashland, LP's Program License approving the above requested conditions and establishing the following additional conditions:

3. *Prior to using any site for the land application of wood ash exceeding the (2,250 mg/kg) screening standard for manganese in 06-096 CMR 418, Appendix A, the applicant shall representatively sample and analyze the soil once for (background) manganese.*
4. *At any site used for the land application of wood ash exceeding the (2,250 mg/kg) screening standard for manganese in 06-096 CMR 418, Appendix A:*
 - A. *The SI shall be estimated in accordance with the calculations in 06-096 CMR 419, Appendix A(2)(C) and use of the site shall be limited such that the combined total of the SI (estimated soil pollutant concentration increase) plus the soil background concentration does not exceed the (2,250 mg/kg) screening standard in 06-096 CMR 418, Appendix A for manganese; and*
 - B. *The useful life of the site shall be limited such that should the level of manganese increase, site life is adjusted downward to ensure that the SI plus the soil background concentration does not exceed the (2,250 mg/kg) screening standard in 06-096 CMR 418, Appendix A for manganese.*

Boralex Ashland, LP is appealing the conditions 3 and 4, above, as imposed by the Maine Department of Environmental Protection.

Basis of the Appeal

The Department has not established an appropriate risk based standard for manganese for Agronomic Utilization and is now attempting to use the manganese screening standard in Chapter 418, Appendix A to regulate the Agronomic Utilization of residuals, such as wood ash, containing manganese. After 10 years of regulating metals in wood ash under Chapter 419, the Department is attempting to change regulation by establishing a new policy and regulating metals (specifically manganese) in wood ash under Chapter 418. By imposing Conditions 3 and 4 of the Minor Revision, the Department is imposing an increased burden on wood ash generators without justification, with no evidence that the current ash utilization program is unsafe, and at a great cost to Boralex Ashland, LP.

1. **This change is inconsistent with the "no site license" program established in Chapter 419 and managed by the Department for the last 10 years.** Wood Ash has been successfully managed in Maine for over 25 years. Initially, under Chapter 567, each generator had to obtain a Program License for Wood Ash Utilization and then obtain individual site licenses prior to utilizing ash on agronomic sites. After many years of administering Chapter 567, the Department correctly recognized that the requirement for site licensing was an unnecessary burden on wood ash utilization programs and developed a reduced procedure site licensing procedure for ash utilization sites. Upon the enactment of Chapter 419, the Department went further, allowing non-pollutant containing residuals such as wood ash to be further deregulated and eliminating the requirement for individual site licenses. Under Chapter 419, generators are allowed to "generally distribute" qualifying wood ash to sites without site licenses provided that site operators provide a product label and utilize Best Management Practices (see attached).

Boralex Ashland, LP (formerly Northeast Empire Limited Partnership #2) obtained a Wood Ash Agronomic Utilization Program License in November, 1993 (#S-021177-SE-A-N). Since then, wood ash from the boiler in Ashland has been successfully managed and has provided local farmers with a cost-effective lime and nutrient source. On June 21, 2002, the Department issued a renewal and amendment of the original program approval to bring it into compliance with Chapter 419. Finding 8.D.(1) of this amendment allows for the distribution of Boralex Ashland ash without the requirement for site specific permitting or soil testing, as long as the ash is applied at rates at or below the crop uptake rate for phosphorus and the ash "does not exceed applicable screening standards in chapter 419, Table 419.4 for heavy metals". Finding 4.A. of the amendment states that "The applicant has performed initial analyses for total inorganic compounds in accordance with Chapter 405, Section 6D(2)(d). The results indicate that all are within the applicable limits in Chapter 419, Table 419.4, and Chapter 418, Appendix A. There is no finding regarding elevated levels of manganese in the ash, presumably because the Department did not have a standard applicable to manganese in ash that was destined for agronomic use.

2. **The Solid Waste Rules are clear that the screening standards in Chapter 418, Appendix A are to be used to screen for hazardous substances “other than metals”.** Chapter 419.1.D states that Agronomic Utilization is a type of beneficial use and that generators proposing to beneficially use solid waste or waste derived products in a manner that **does not constitute agronomic utilization** must meet the applicable standards of Chapter 418. This suggests that the standards in Chapter 418 are intended to apply to beneficial uses **other than agronomic utilization** and precludes using Chapter 418, Appendix A to regulate the Agronomic Utilization of wood ash.

Chapter 405 6.D.(2)(d), Specific Analytical Requirements, Initial Residual Analysis, requires initial testing for manganese in ash that is to be used under Chapter 419. Chapter 419.7.A(4)(a) requires a “a demonstration that the residual meets all of the applicable screening standards in Table 419.3 column A, Table 419.4, columns A through C, or Table 419.5, column A; and the screening standards for hazardous substances **other than metals** in Chapter 418, Appendix A” (emphasis added). This clearly indicates that the Department set the standards for metals in Chapter 419 and that the standards in Chapter 418 are not to be used to screen metals levels in materials destined for agronomic use.

Ash from Boralex Ashland, like most wood ash, has always exceeded the 2,250 mg/kg screening standard in Chapter 418, Appendix A. We believe the Department always intended to use Chapter 419 not Chapter 418 to regulate metals in residuals that are agronomically utilized. Furthermore, manganese was never discussed during the Chapter 419 rule making process as a metal of concern as it has been viewed as an essential plant nutrient. As further evidence, please note that Chapter 419 regulates the metals of concern for Agronomic Utilization yet manganese is not included:

- Table 419.3, Heavy Metal Standards for sewage sludge utilization (manganese is not listed),
- Table 419.4, Heavy Metal Standards for ash and other liming agents (manganese is not listed), and
- Table 419.5, Screening Concentrations for Other Residuals and maximum allowable soil concentrations at utilization sites (manganese is not listed).

There is some question as to whether the lack of a manganese standard in Chapter 419 was an oversight. Even if it was, the Department has issued several licenses that are either silent on the manganese issue or acknowledge that manganese levels exceed the Chapter 418 screening standard, but go on to conclude that the ash is suitable for land application without further site licensing or management conditions because manganese is a necessary micronutrient, modeling shows that it would take decades of repeated applications to approach soil screening levels, and decades of repeated applications are precluded by the pH of ash amended soils. We believe that nothing has changed since the issuance of those findings, and that a re-interpretation of the rules, after 10 years of licensing and operation is not warranted.

3. **The Department has not conducted a risk assessment or adjusted the screening standard in Chapter 418, Appendix A to account for the calcium carbonate equivalence of the ash, exposure pathways of concern, or for the availability of manganese in ash amended soils.** All the other screening standards for metals regulated in Chapter 419 have been adjusted by the Department to consider the unique characteristics of liming agents and the pathways most likely to result in exposure in an agricultural setting. During the development of Chapter 419, and the ensuing rulemaking process, the Department determined that using the standards in Chapter 418, Appendix A without adjusting for these factors was inappropriate. The Department spent considerable resources studying the fate of metals in agronomic soils. In particular, the Department developed Table 419.4, which was developed specifically for the evaluation of residuals to be used in agriculture as liming agents. This table considers the effect of calcium carbonate equivalence in limiting both the application rate of liming agents and the number of applications of ash that can be made.

It also appears that the manganese screening standard in Chapter 418, Appendix A is derived from an EPA risk assessment and represents the screening standard for residential ingestion. We question whether a residential ingestion standard (if in fact that is what the Department used back in 1999) is the appropriate standard for agronomic use.

4. **The elevated soil levels of manganese that the Department describes in its findings are suspect and the average soil analysis of Maine soils are less than half the screening limit.** Finding 6.A of the Minor Revision states that "The Department has observed that analyses performed on some soils in the Aroostook County area indicate background manganese concentrations of up to 2,000 mg/kg at some non (wood ash)-amended sites." After requesting the location of the sites with elevated manganese levels, we re-sampled several of the farms and found no soils in excess of the 2,250 mg/kg screening standard (Table 1.).

This spring, in anticipation of receiving the Minor Revision, Boralex Ashland conducted soil sampling on agricultural sites that included total manganese and available manganese. Table 2. (Attached) indicates that manganese levels in Aroostook County soils are variable, but do not routinely approach the soil screening standard. Modeling of likely application rates of Boralex Ashland ash (Table 3.) indicates that the average site could be used for up to 111 consecutive years without soil concentrations reaching the 2,250 mg/kg screening standard. Considering that ash applications are based on pH needs and that sites must be discontinued upon reaching the optimum pH, ash applications will be suspended long before the soil screening standard for manganese could be expected to be reached. At an average application of once every other year, the average site could be amended every other year for 222 years (2 years X 111 years).

Table 1. also shows that very little of the total manganese found in Aroostook County agricultural soils is available to plants. In all cases the available manganese is at least one order of magnitude lower than the total. Boralex Ashland, LP believes that this data shows that manganese on managed agricultural soils is not available and does not pose a risk to agronomic crops.

5. **The cost to ash generators of this change in interpretation is substantial.** The cost of total manganese analysis, using pricing from the University of Maine Soil Testing Service is \$25 per sample, not including postage. The data shown in Table 1. required 50 hours of staff time at a cost of approximately \$3,750 or roughly \$60 per sample for labor. The combined cost (analytical plus labor) is approximately \$85 per sample. Based on an annual generation of 11,000 tons per year, an average application rate of 3.0 tons per acre and a maximum allowable acreage of 8 acres per soil sample, Boralex will need approximately 458 samples this year at a cost of \$38,930 to conduct initial sampling on its sites.
6. **The Department's new interpretation of Chapter 419 has not been applied consistently, as would have been the case with a rule change.** Over 12 ash generators are operating under Agronomic Utilization Program Licenses but only 3 generators (to our knowledge) are currently required to do soil testing for total manganese. This creates increased costs for ash generators subject to these conditions putting them at a competitive disadvantage in the marketplace. If the Department extends this interpretation to all ash generators, the cost of ash recycling can be expected to increase by hundreds of thousands of dollars, with no clear benefit to the environment. Increased costs for agronomic use may have the unintended consequence of make landfill a more viable alternative, which would be in conflict with the Maine Solid Waste Hierarchy.

Remedy

If the Department wishes to regulate additional metals beyond those which were included in Chapter 419, it should undertake the same risk assessment and scientific scrutiny that was given to the other metals. The rulemaking process for Chapter 419 was extensive and a great deal of effort went into establishing the metals standards for various materials and uses. The attempt to apply the Chapter 418 standard directly to agronomic use of ash, without adjusting for the CaCO_3 of the material or consideration of the limiting factors presented by the agronomic use of ash (e.g. cost of the liming agent, site discontinuance due to CaCO_3 levels and pH) is inappropriate.

Boralex Ashland, LP respectfully requests the following remedy:

The Board of Environmental Protection should vacate Conditions 3 and 4 from Boralex Ashland, LP's Program Approval Minor Revision #S-021177-SE-G-M.

Should the Board of Environmental Protection find that there is sufficient risk posed by wood ash manganese levels, the Board should order the Department to undertake a risk assessment and propose an appropriate risk-based standard for manganese that is specific to Agronomic Utilization of Ash and Liming Agents under Chapter 419.

Upon completion of any risk assessment, the Department should undertake rulemaking to allow the regulated community to offer science-based testimony on the proposed manganese standard.

BEST MANAGEMENT PRACTICES - Boralex Wood Ash



Order #:	_____
Date:	_____
Acct.:	_____

Customer Information

Company:	Contact:
Address:	e-mail:
City:	State: Zip:
Phone:(207)	Fax: Cell:

Product Information

Product: Wood Ash - Boralex Ashland Other: _____	Quantity_____>	Tons:	Yards:
	Quantity will spread:	Max. Appl. Rate:	Max. Appl. Rate:
	Acres	Tons/Acre	Yards/Acre

HANDLING, STORAGE AND USE RECOMMENDATIONS, GUIDELINES AND RESTRICTIONS

Personal Safety:

Please note, as with any liming agent, fertilizer and/or soil amendment, these products have physical and/or chemical properties that may cause skin or eye irritation in some individuals. Therefore, use appropriate precautions during the handling of these products to minimize inhalation and/or exposure to the skin, eyes, and mucous membranes. Such precautions should include the use of personal protective equipment (gloves, protective eyewear, dust masks, etc.)

Storage: (NEO Project Manager: check off applicable criteria)

Stockpile 1 Address: _____ **or GPS Coords:** _____

Stockpile 2 Address: _____ **or GPS Coords:** _____

Stockpile 3 Address: _____ **or GPS Coords:** _____

- ☐ As with any liming agent, fertilizer and/or soil amendment, these products must be stored in a location with low potential for human contact. Storage locations must be located a minimum of 100 feet from occupied dwellings.
- ☐ Storage locations must be located on level areas that will minimize potential for surface water contact.
- ☐ Storage locations must be setback a minimum of 25 feet from property boundaries and public roadways, 50 feet from surface waters, 100 feet from private drinking water wells and 300 feet from public water supplies.
- ☐ In a 100-year floodplain, product may be stored up to 90 days if storage is initiated after abatement of spring high water and all stockpiles are removed and fully utilized no later than October 15.
- ☐ Product must be utilized within two (2) years of delivery date
- ☐ Special Conditions or Requirements _____

NEO Project Manager Acknowledgement (initial here)

Utilization: (Customer:acknowledge by checking off all utilization criteria)

- ☐ Product must not be applied at a rate greater than the maximum application rate listed above.
- ☐ Product must not be applied when the ground is frozen, snow-covered or water-saturated.
- ☐ Product must not be applied in diversions, drainage ditches, gullies, non-vegetated swales, ravines, or on bedrock outcrops.
- ☐ Product must not be applied within 25 feet of property boundaries and public roadways, 50 feet of surface waters, 100 feet of private drinking water wells, and 300 feet of public drinking water supplies.
- ☐ Product must be utilized in a manner to minimize the potential for off site migration of fugitive dust, odors and other nuisance conditions.
- ☐ Product must be applied at or below the crop uptake rate for Phosphorus.

Customer acknowledgement (initial)

I have read, understand, and agree to use the above product in a manner consistent with the recommendations, guidelines and restrictions listed above.

Customer Authorized Signature

Company

Date

NEO Representative

Printed Name

Date

Updated: 7/28/09

Wood Ash Ashland, ME

"I have been using Boralex Ashland wood ash to help with nutrients for my crops. The calcium, potassium and other nutrients supplied by wood ash help lime my soil and provide balanced nutrition necessary for good potato, grain and hay production.

Wood ash is a cost effective source of lime and nutrients. In these times of high nutrient costs, the use of locally produced wood ash is a sustainable farming practice that saves me money.

In addition to wood ash, New England Organics has provided me with agronomic advice and excellent service."

Donald Fitzpatrick
Houlton, ME



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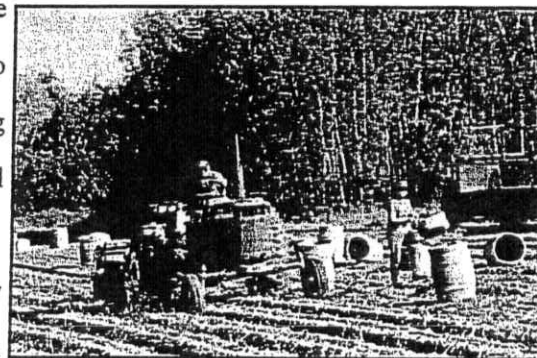
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Fax: 207-948-5352

PRODUCT ANALYSES	Guaranteed Minimum	Average	lbs/ton (avg)
pH.....	12.0	12.8	n/a
% Solids.....	50.0%	70.3%	n/a
Organic Matter.....	8.5%	17.3%	243
Total Calcium.....	8.0%	13.2%	186
Available Phosphoric Acid (P ₂ O ₅).....	0.01%	0.37%	5.2
Soluble Potash (K ₂ O).....	0.5%	2.8%	39.4
Magnesium (Mg).....	0.5%	1.34%	18.8
Calcium Carbonate Equivalence.....	25.0%	48.0%	675
Boron.....	0.005%	0.017%	0.23
Copper.....	0.003%	0.006%	0.09
Manganese.....	0.3%	0.78%	11.0
Zinc.....	0.005%	0.1%	1.3

Industrial by-product (wood ash) data based on averages (dry weight) of representative analyses.
Lbs/ton values based on product as received.

PRODUCT INFORMATION:

Wood Ash is produced from the combustion of clean wood and bark to produce electricity. The resulting product is an agricultural soil amendment ideal for balancing soil pH and enhancing nutrient levels. New England Organics is able to custom



design a nutrient application schedule to fit any crop rotation in order to meet the needs of the crop and producer.

USE RECOMMENDATIONS:

Potato Crops: 2.0 tons of Boralex Wood Ash is equivalent to the liming value of one ton of commercial lime and provides approximately 10.4 lbs of available P, 78.8 lbs of soluble K, and 37.6 lbs of magnesium. Typically Boralex Wood Ash is applied after potato crop is harvested and before the next rotation crop. For example, apply Boralex Wood Ash after potato harvest and before planting small grains or after grain harvest and before the next grain planting or hay seeding.

Sample Rotations using Boralex Wood Ash

Year 1	Year 2	Year 3	Year 4
Grain	Potato/ash	Grain	Potato/ash
Grain/ash	Hay	Potato/ash	Grain
Grain/ash	Grain	Potato/ash	Grain
Green Manure	Potato/ash	Green manure	Potato/ash

Table 1.
Retest of LP Soil Samples
Manganese Soil Testing Results

Farm Name	DEP Reported Result*	Boralex Retest Results			
	Total Mn	Date	Farm/Field Name	Sample #	Avail Mn (Mehlich-3 method) Total Mn
Eric Lincoln	2,700	7/17/2009	Eric Lincoln LOW FM1	FF17741	69 1068
		7/17/2009	Eric Lincoln LOW FM2	FF17742	33 1129
		7/17/2009	Eric Lincoln LINCOLN RD	FF17743	67 954
Richard Sloat	2,000	7/17/2009	Richard Sloat SLOAT PLAT 1	FF17744	56 1297
		7/17/2009	Richard Sloat SLOAT PLAT 2	FF17745	47 1136
		7/17/2009	Richard Sloat SLOAT PLAT 3	FF17746	40 1072
P. Brennan	2,000	7/17/2009	P. Brennan BRENNAN 397E	FF17747	41 961
Travis Libby	1,900	7/17/2009	Travis Libby LIBBY	FF17748	58 980
Average	2,150				51 1,075

* From telephone conversation with Jay Duncan of the Maine DEP from results reported by Louisiana Pacific.

Table 2.
Boralex Ashland
Manganese Soil Testing Results
Spring Sampling

Name	Date	Field Name	Sample #	Soil PH	Avail Mn (Mehlich-3 method)	Total Mn
Edgecomb, Bob	06/16/09	HOME 7	E37932	5.7	28	478
Yoder, Dan	04-24-2009	FRONT	E20070	6	46	1623
Yoder, Dan	04-24-2009	BACK WEST	E20071	5.6	48	1601
Yoder, Dan	04-24-2009	BACK MID	E20072	5.6	53	1347
Yoder, Dan	04-24-2009	BACK EAST	E20073	5.3	43	890
Howard, Gary	05-08-2009	ROUSE A	E20098	6	40	910
Howard, Gary	05-08-2009	ROUSE B	E20099	6.1	65	1173
Howard, Gary	05-08-2009	ROUSE C	E20100	6.4	51	891
Howard, Gary	05-08-2009	ROUSE D	E20101	5.5	42	797
Howard, Gary	05-08-2009	ROUSE E	E20102	5.8	41	927
Howard, Gary	05-08-2009	ROUSE F	E20103	5.7	34	770
Howard, Gary	04-30-2009	HOME A	E20104	5.8	35	803
Howard, Gary	04-30-2009	HOME B	E20105	5.8	40	759
Howard, Gary	04-30-2009	TABOR A	E20106	5.9	32	737
Howard, Gary	04-30-2009	TABOR B	E20107	5.6	39	1210
Howard, Gary	04-30-2009	TABOR C	E20108	5.9	33	944
Howard, Gary	04-30-2009	TABOR D	E20109	5.8	33	855
Howard, Gary	04-30-2009	TABOR E	E20110	5.9	31	888
Howard, Gary	04-30-2009	TABOR F	E20111	6	27	858
Howard, Gary	04-30-2009	TABOR G	E20112	6.4	24	866
Howard, Gary	04-30-2009	DUNCAN A	E20113	5.6	35	997
Howard, Gary	04-30-2009	DUNCAN B	E20114	6.1	32	987
Howard, Gary	04-30-2009	HAINES A	E20115	6	31	708
Swartzentruber, Joe	04-21-2009	GARDEN	E13551	6.2	48	1200
Swartzentruber, Joe	04-21-2009	BACK 20 T	E13552	5.6	41	1083
Swartzentruber, Joe	04-21-2009	BACK 20 B	E13553	6.1	64	990
Swartzentruber, Joe	04-21-2009	STRIP 1	E13554	5.4	33	821
Swartzentruber, Joe	04-21-2009	STRIP 2	E13555	5.3	35	880
Swartzentruber, Joe	04-21-2009	STRIP 3	E13556	5.8	33	968
Yoder, Noah	05-08-2009	F1	E20088	5.7	43	976
Yoder, Noah	05-08-2009	F2	E20089	5.7	39	1026
Yoder, Noah	05-08-2009	F3	E20090	5.8	30	845
Yoder, Noah	05-08-2009	F4	E20091	6.3	56	937
Yoder, Noah	05-08-2009	F5	E20092	5.9	60	830
Yoder, Noah	05-08-2009	F6	E20093	6.4	54	718
Yoder, Noah	05-08-2009	F7	E20094	5.1	29	193
Yoder, Noah	05-08-2009	F8	E20095	5.7	32	659
Yoder, Noah	05-08-2009	F9	E20096	5.6	31	565
Yoder, Noah	05-08-2009	F10	E20097	5.7	17	348
Smith, Carl PI	06-24-2009	WOODS	E40956	5.6	22	577
Sweetser, Wayne	05-13-2009	F1	E22363	5.9		597

Table 2.
Boralex Ashland
Manganese Soil Testing Results
Spring Sampling

Name	Date	Field Name	Sample #	Soil PH	Avail Mn (Mehlich-3 method)	Total Mn
Sweetser, Wayne	05-13-2009	F2	E22364	6		661
Sweetser, Wayne	05-13-2009	F3A	E22365	5.6		712
Sweetser, Wayne	05-13-2009	F3B	E22366	5.7		650
Foster, Dan	06-24-2009	HOME 1	E40952	6.2	55	916
Foster, Dan	06-24-2009	HOME 2	E40953	5.7	42	913
Lucern/Cyr	06-25-2009	PIE	E40948	6.8	67	691
Lucern/Cyr	06-25-2009	BOTTOM	E40949	7.3	79	1033
Lucern/Cyr	06-25-2009	MIDDLE	E40950	7.1	62	1037
Lucern/Cyr	06-25-2009	TOP	E40951	7.1	71	1001
McHatten, Hugh	06-25-2009	BY HOUSE	E40960	5.4	27	689
McHatten, Hugh	06-25-2009	BOTTOM	E40962	5.7	34	898
McHatten, Hugh	06-25-2009	MIDDLE	E40963	6.5	57	1239
McHatten, Hugh	06-25-2009	TOP	E40964	6.1	66	1149
Conolly, Roger	06-26-2009	BIG	E40946	5.2	26	527
Conolly, Roger	06-26-2009	SMALL	E40947	5.4	33	691
Haley, Milton	06-26-2009	FRONT	E40944	5.4	41	981
Haley, Milton	06-26-2009	BACK	E40945	5.5	26	670
Leavitt, Randy	06-24-2009	WARD 1	E40957	6.2	47	861
Leavitt, Randy	06-24-2009	WARD 2	E40958	6.3	43	820
Leavitt, Randy	06-24-2009	WARD 3	E40959	5.3	35	675
Madore, Ron	06-25-2009	MADORE A	E40954	5.4	39	724
Madore, Ron	06-25-2009	MADORE B	E40955	5.6	34	809
				# of Samples	Avail. Mn average	Total Mn average
				63	41	866

Table 3.
Boralex Ashland
Estimation of Site Life and Soil Loading Calculations for Manganese

	Boralex Ashland	Plant Total Mn (mg/kg)	Ash Analysis Solids (%)	CaCO3 (%)	Application Rate (dry tons/acre)	Application Rate (wet tons/acre)	Dry Pounds of Total Manganese Applied in 1 Application	Column A. Soil Results for Manganese (mg/Kg)	Column B. # Mn in topsoil*	Column C. Maximum Allowable Mn MEDEP Chapter 418 (mg/kg)	Column D. Max Allow. # Mn in Topsoil	Column E. Addt # Mn/acre allowed (Column E less Column C)	Column F. Average Dry # per Application (see above)	Column G. # of Applications before Max Allowable Soil Concentration is reached (Column E divided by Column F)
		7,825	70%	48%	2.08	1 dry tons of CaCO3 equivalence								
					2.96	1 dry tons of CaCO3 equivalence								
							32.60 dry pounds per acre							
Average of Boralex Testing		866						1,733	2,250	4,500	3,634	32.60	111	
Average of LP Retest		1,075						2,149	2,250	4,500	3,425	32.60	105	

* Assumes 2 million pounds of topsoil in top 6 inches